Metascience (16), 2007, pp.549–553.

REVIEW: Evan Selinger (ed.), Postphenomenology: A Critical Companion to Ihde. Albany: State University of New York Press, 2006.

THE MULTISTABLE ONTOLOGY OF DON IHDE

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Over the past four decades, Ihde's phenomenological approach has been instrumental in countering the traditional understanding of scientific knowledge as abstract and contemplative, an idea that has construed the relationship between science (as 'originary' theory) and technology (as derivative praxis) in epistemologically hierarchical terms. In this classical understanding, technological apparatuses are the material or instrumental substrate; they work to prove or provide evidence of what is already effectively known via contemplative reasoning, or by way of a thinking that is untainted by the secular and carnal fallibilities of either bodily or instrumental perception. Yet increasingly, as Ihde documents, experimental praxis and perception have become essential to scientific knowledge, such that science can be more aptly named technoscience – a term that points to the inextricable and irreducible relation between modern science, the tools and historically located concepts used to achieve that knowledge, and the body–technology relations implicit in any knowledge-in-the-making. Technology, for Ihde, is not an application of science. Rather, scientific and industrial knowledge emerges from specific body–technology couplings that in turn generate particular, contextual, located techno–perceptual ways of determining what can be known. This understanding of interpretive possibility also describes the non-neutral and transformative effects of techno- scientific activity, the latent epistemological and ontological 'inclinations' or 'trajectories' of any apparatus or device used to grasp or literally 'take hold' of the world, and thus the impossibility of objectivity in scientific – or indeed any – knowledge.

In the introduction to this collection, editor Evan Selinger provides both a biographical and conceptual overview of Ihde's substantial body of work, navigating the path to his non-foundational post-phenomenology which has effectively combined phenomenology, pragmatism and hermeneutics. The first section (Part I. Phenomenological Style: Ihde's Unique Voice) is then devoted to a discussion of Ihde's unique methodology, with contributions from Vivian Sobchack and Carl Mitcham. Sobchack's inspirational chapter describes Ihde's 'simple grounds' – a variational ontology wherein Ihde uses the familiarity and particularity of his own individual micro-perceptions and body–tool relations as a means to comprehend the multi-stable and macro-perceptual regularities of contemporary ways of being and knowing. Mitcham, who is recognised as one of the foremost philosophers of technology, offers an instructive history of the pragmatist tradition and its influence upon Ihde's phenomenology – in particular the way in which pragmatism's practical approach can be used to challenge classical phenomenology's foundationalist, essentialist, and often a-political pretensions.

The next section (Part II. Listening to Ihde: Phenomenology and Sound) focuses on the post-phenomenological relation between embodiment and acoustic technologies – both an early and recurring theme in Ihde's work. Lenore Langsdorf reflects upon the way that Ihde's 'processual and relational metaphysics' can be used to interpret the perceptual contexts of the auditory dimension. Significantly, as Langsdorf notes, Ihde's 'second phenomenology' countermands the visualist bias inherent in much of the philosophical tradition, by insisting that perception is always a whole-of-body experience – no single sense can be considered in

isolation from either embodiment or circumstance. Trevor Pinch considers the medium specificity of sound by narrating the particular history of the synthesiser and its emergence within a complex socio-technical environment, and by describing how design choices in the development of a technology 'afforded' specific contexts of use and large-scale adoption of musical sounds. In the final contribution to this section, Judy Lochhead reiterates the theme of sensory holism evident in Ihde's phenomenology, suggesting how sound can be not only heard but visualised, 'sensed', and preserved by means of a range of gestures, numbers, graphic symbols, models, and maps.

Part III (Normative Commitments: Ihde at the Crossroads of Ethics and Politics) deals with a central and recurring critique levelled at phenomenology – the neglect of the normative, political, and ethical dimensions of the life-world. In the first essay, against the claim that Ihde lacks 'normative sensitivity', Selinger argues that Ihde's commitment to phenomenological description, intentionality and the 'fidelity of context', critically reveals how both utopian and dystopian theories of technology often do not correspond to empirical reality. Rather, they tend to 'correlate with selective perceptual attention' – the most prevalent of these being the cultural and visualist biases of Western philosophy. In his chapter, Paul B. Thompson claims that although Ihde's insights have shown (pace Heidegger) how tools are embodied and absorbed in the 'noetic dimensions of intentionality', variably amplifying and reducing perceptual possibility, neither Ihde nor his followers have effectively used post-phenomenology for ethical analysis. Peter-Paul Verbeek, well-known design philosopher and proponent of STS, also considers the domain of ethics. He reflects on how a critical understanding of technological agency can be used to articulate the material dimension of morality – human actions are not determined by intention alone but also by the material environment; tools and things co-constitute reality and thus inevitably co-shape morality. Post-phenomenology, therefore, must move beyond primarily descriptive accounts of the world and attend to the normative 'relationality' of being.

Part 4 of Postphenomenology turns to critical appreciations of the Heidegger–Ihde connection. Robert C. Sharff contends that Ihde doesn't do justice to either Heidegger or Merleau-Ponty, and he critiques both Ihde's neglect of issues of gender and race, and the problematic body–perceptual/cultural–linguistic dualism emerging from Ihde's recent text Bodies in Technology. Richard A. Cohen in his essay concurs with Ihde's interpretation of technology as an 'extension of human embodiment' that is thoroughly embedded in socio-cultural contexts. Returning to the theme of the previous section, Cohen contends that pure instrumentality divorces essence from existence, and so ignores the 'more profound dimension of being-in-the-world' – that of ethical evaluation. The final chapter in this section describes the Columbia Shuttle disaster with reference to Heidegger's description of technological breakdown, where the working tool becomes 'invisible' to the user until it malfunctions. Followers of Ihde will recognise recurrent phenomenological themes concerning our immediate involvement with the 'equipmental' environment, and its co-determination of the epistemic and ontic boundaries of knowledge and praxis.

The fifth part of this compilation – Perceiving Bodies – contains four essays by theorists from distinct yet increasingly intersecting disciplines. Each engages with Ihde's treatment of perception and embodiment, and several also turn to his close alignment with Merleau-Ponty's concept of the 'corporeal schema', as a way to describe the 'polymorphous' openness of the body to technological mediation. For Donna Haraway, technoscientific discourse is intrinsic to the way we understand our bodies, and our biology and physiology are increasingly articulated by a range of technological ensembles and machine visions. Her study of Crittercam – a TV series that featured video footage from tiny cameras mounted on

penguins, turtles and whales – insightfully illustrates the delegation of hermeneutic and material agency to human, animal and machine beings, who together 'infold to become the multi-sensory "flesh'' of contemporary naturecultures'. Andrew Feenberg argues that the two-body model described by Ihde in Bodies and Technology (2002) doesn't account for the passive dimension of embodiment. To the first 'sensory' body and the second 'culturally shaped' body, Feenberg adds 'body three' (the 'dependent' body acted upon by other humans and technologies) and 'body four' (the 'extended' body modified by technologies), and claims that the latter two are characterised by a specific kind of instrumentally embodied passivity.

The third essay by Donn Welton concentrates on 'how the body is involved with machines', appending Ihde's own critical adaptation of Merleau-Ponty in detailing how corporeal schema and sub- schema absorb tools into the repertoire of the body. In the final chapter, Andrew Pickering provides a decidedly SSK slant to Ihde's method, maintaining that the centrality of the human body in Ihde's phenomenology, and its concomitant situatedness, makes ontological symmetry between human and non-human impossible. Pickering uses the term 'ontological engine' to describe how machines can help us to think about ontology, 'rather than deceiving us about epistemology'. That is, they can show us not just how we represent the world but how we 'get along materially'. In this respect, he argues, humans are not in an ontologically privileged position.

Part 5, entitled Framing Science, is concerned with how Ihde's work, and philosophy of technology more generally, has provided conceptual tools for the critical interpretation of scientific knowledge-making. In the first essay, Robert P. Crease proposes that the concept of 'performance' can offer both a hermeneutic and phenomenological framework for understanding experimental science, and discusses the particular case of IBM's Blue Gene project (which aimed to construct a computer capable of simulating the complex process of protein folding). Finn Olesen's chapter utilises Ihde's account of technical mediation to frame questions surrounding the application of high-tech solutions in health care. Olesen considers, following Ihde, how 'subjects and artifacts constitute each other in praxis' and documents the non-neutral transformative effects of techno–acoustic amplification upon the diagnostic pro- cess. In the third essay, Albert Borgmann identifies one of Ihde's most important ongoing contributions: revealing the irreducible and ontological multi-stability of everyday culture. Indeed, as Ihde notes in his concluding chapter, Borgmann insightfully points to the way in which multi-stability is Ihde's ontology, replacing 'the notion of essences in classical phenomenology'. Finally, Hans Lenk addresses the actual and potential links between philosophy of science and philosophy of technology, and argues that the former might benefit from an 'action-oriented' model of knowledge-making. This anti-theoreticist approach, Lenk comments, is exemplified by Ihde's efforts to incorporate instrumental realism into the philosophies of science and technology.

The book finishes with a generous and considered response from Ihde to many of the themes and concerns raised by his nineteen readers–critics. In its entirety, this quite exceptional collection illustrates the broad inter-disciplinarity of Ihde's thinking, and the way in which his relational and multi-stable ontology can fruitfully 'speak' to so many theoretical perspectives about technology and science.

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